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This document contains up-to-date chemical information, including a summary of the Agency's regulatory position and rationale, on a specific pesticide or group of pesticides. A Fact Sheet is issued after one of the following actions has occurred.

1. Issuance or reissuance of a registration standard,
2. Issuance of each special review document,
3. Registration of a significantly changed use pattern,
4. Registration of a new chemical, or
5. An immediate need for information to resolve controversial issues relating to a specific chemical or use pattern.

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EPA

Pesticide Fact Sheet

Name of Chemical: DICOFOL
Reason for Issuance:
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1. DESCRIPTION OF THE CHEMICAL

- Generic Name: Dicofol
- Common Name: Dicofol
- Trade Names: Acarin®, Carbax®, Decofol®, Kelthane®, Kelthane A®, p,p' Kelthane®, Mibol®, and Mitigan®
- Chemical Abstracts Service (CAS) Number: 115-32-2
- EPA Shaughnessey Number: 010501
- Year of Initial Registration: 1957
- Pesticide Type: Acaricide
- U.S. and Foreign Producers: Rohm & Haas, Aceto, Makhteshim Beer-Sniva, Agan Chemical, Drexel Chemical, Tricon Chem International, and Ida, Inc.

2. USE PATTERNS AND FORMULATIONS

- Foliar spray on agricultural crops and ornamentals, and in or around agricultural and domestic buildings for mite control.
- Formulated as emulsifiable concentrates, wettable powders, dusts, ready-to-use liquids, and aerosol sprays.

3. SCIENCE FINDINGS

Summary of Science Findings

- There are insufficient data available to characterize the environmental fate of dicofol, however, groundwater contamination is not expected due to dicofol's lack of mobility in soil and low leaching potential.
- There are insufficient data available to determine the oncogenicity, teratogenicity, mutagenicity, and chronic feeding effects of dicofol.

° The data show that dicofol is highly toxic to aquatic organisms and only slightly toxic to birds, mammals, and beneficial insects.

° Dicofol bioaccumulates in some rotational crops and aquatic organisms.

° The DDT analog contaminants in dicofol may cause unreasonable adverse effects in certain bird and fish species.

Chemical Characteristics

° Manufacturing-use dicofol products contain a number of DDT analogs as manufacturing impurities. These impurities include the o,p' and p,p' isomers of DDT, DDE, DDD, and a substance called "extra-chlorine DDT" or Cl-DDT.

° Dicofol is a nonflowable liquid (or waxy solid), ranging from dark to yellow-brown in color. It is stable under cool and dry conditions, is practically insoluble in water, but soluble in organic solvents. Its melting point ranges from 58°C to 78°C. The chemical does not pose any unusual handling hazards.

Toxicological Properties

° Dicofol has a moderate acute oral toxicity (Toxicity Category III).
° Dicofol has a relatively high degree of acute dermal toxicity (Toxicity Category II).
° Results from an eye irritation test using a formulation intermediate indicates that the manufacturing-use product is probably a severe eye irritant (Toxicity Category I).

° Toxicity studies on dicofol are as follows:

- Oral LD_{50} in rats: 684 - 1495 mg/kg body weight
- Oral LD_{50} in rabbits: 1810 mg/kg body weight
- Dermal LD_{50} in rabbits: 2.1 gm/kg body weight
- Eye Irritation: tests with a formulation intermediate showed corneal damage in some rabbits that persisted for seven days
- Subchronic Oral Toxicity in Rats: NOEL is 20 ppm.
- Oncogenicity in Rats: Available data from the National Cancer Institute suggests that dicofol is a possible oncogen. However, the study is unacceptable due to the reported decomposition of the test material during the test.
- Reproduction Study in Rats and Mice: The NOEL for both rats and mice is 100 ppm.

Environmental Characteristics

- Dicofol was stable for 350 days at 10 ppm in field plots under aerobic conditions.
- Aged dicofol residues are negligibly mobile in sandy loam soil column leaching studies.
- Field studies show that dicofol persists in soils for at least 4 years after application.
- Dicofol residues may accumulate in fish as well as some rotational crops.

Ecological Characteristics

- The DDT analog contaminants in the dicofol products can cause reproductive impairment in various fish and flesh eating birds (eggshell thinning).
- Avian dietary LC_{50}: 1237 to 3100 ppm for upland game birds (slightly toxic).
- Prolonged exposure to low levels (5 to 10 ppm) had no significant effects on reproduction behavior of mallards.
- Acute 96-hour LC_{50} for warm water fish: 0.31 to 0.51 ppm.
- Acute 96-hour LC_{50} for cold water fish: 0.053 to 0.086 ppm.
- Acute LD_{50} for marine grass shrimp: >0.439 ppm.
- Findings show that dicofol is highly toxic to aquatic organisms.
- Dicofol impairs the reproductive physiology of fish and aquatic invertebrates.
- Dicofol does not seem to be phytotoxic to most plants for which it is registered.
- Dicofol has been shown to be relatively nontoxic to honey bees and alfalfa leafcutting bees.

Tolerance Assessment

- Current application rates on labeling exceed the rates associated with the established tolerances. Tolerances and/or labeling may need to be revised to correct this discrepancy.

° Residues of the dicofol impurities will have to be examined for the tolerance reassessment.

4. SUMMARY OF REGULATORY POSITION AND RATIONALE

° No use, formulation, or geographical restrictions are required. General use classification.

° A Special Review of all dicofol end-use products containing detectable amounts of DDT analogs will be initiated.

° No new registrations will be issued for new dicofol products intended for outdoor use which would further increase the amount of DDT in the environment.

° Registrants and applicants for registration of manufacturing-use dicofol products must agree to develop the data as specified in the Guidance Document. Manufacturing-use dicofol products may be registered and/or reregistered subject to the terms and conditions specified in detail within the Guidance Document.

° Registrants and applicants for registration must submit data regarding the composition of their products and in particular the concentration of DDT contaminants in their manufacturing-use products. Registrants must indicate the lowest levels that could be achieved, the timeframe needed, and the cost. The Agency is concerned about the presence of DDT contaminants at levels substantially below 1% of the technical product because a no-effect-level has not been determined for avian reproductive effects. Agency files show that currently registered manufacturing-use products contain from 9 to 15 percent DDT and DDT analog contamination.

° Studies must be conducted by the registrants to measure whether DDT analog residues will be present on food or feed crops due to the use of dicofol products. A complete tolerance reassessment will be conducted after these data and other required residue data are submitted.

5. SUMMARY OF MAJOR DATA GAPS

° Product Chemistry: product identity, certification of limits, physical and chemical properties, and special requirements as mentioned in Item 4, above. Due April, 1984.

- Residue Chemistry: metabolism in plants and animals, residue analytical methods, updated residue data (including residue data on DDT analogs) on most crops. Due December, 1986.

- Environmental Fate: degradation studies, soil metabolism studies, field volatility, field dissipation, accumulation in fish and rotational crops. Due December, 1986.

- Toxicology: inhalation studies, subchronic feeding, chronic toxicity, oncogenicity, teratogenicity, mutagenicity, metabolism. Due December, 1986.

- Ecological Effects: avian reproduction, aquatic organism testing. Due December, 1986.

- Special Testing For DDT Analog Contaminants: all environmental fate studies conducted on Cl-DDT, chronic testing with Cl-DDT on chronic toxicity on birds, fish, and aquatic invertebrates. Due December, 1986.

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